

Clean Version of Amended Page 9, line 17

a² The box 17 terminates at one axial end 20 where it engages and seals against the body of the pipe section 15 to form a metal-to-metal seal indicated generally at 21. The seal engagement surface of the box 17 is provided by an internal, frustoconical seal surface 22 adjacent the face of the coupling end 20. The seal engagement surface of the pipe section 15 is provided by a frustoconical seal surface 23 formed along the external surface of the pipe.

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a³ The pin 13 is provided with external threads 25 that engage and mate with internal threads 26 formed within the box 17. At the point 28, engagement of the threads 25 and 26 terminates leaving a gap 30 in which the run out threads of the pin are exposed. At the appropriate makeup position between the pin 13 and box 17, the metal-to-metal seal 21 provided by the engaged seal surfaces 22 and 23 prevents entry of fluids from an area A externally of the connection into the annular gap 30 to protect the pin threads from the effects of corrosion.

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a⁴ With reference to Figure 2, an important aspect of the described form of the present invention is that the seal surface 23 is formed within an external cylindrical surface 34 forming the nominal outside diameter of a major portion of the pipe section 15. The threads 25 on the pin 13 run out on a cylindrical surface 35 having a diameter no greater than the nominal diameter of the pipe surface 34. The illustrated design of Figures 1 and 2 permits the use of non-upset pipe for the pin construction and eliminates the requirement to weld or otherwise affix a large tubular end piece to the pipe section in order to secure

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cont a connector that can withstand the effects of dynamic loading in a corrosive environment.

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a5 Figure 3 of the drawings illustrates a modified form of the present invention indicated generally at 36 in which a pipe section 37a with a nominal outside diameter indicated at a cylindrical surface 38 is enlarged to have an outside diameter depicted at 39 to provide a shoulder 41 for a seal surface 42 of a box 45.

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a6 A feature of the embodiment of Figure 3 is that threads 47 on a pin 48 are permitted to run out on the outside diameter of the cylindrical surface 38 which is the same as the nominal outside diameter at 38 of the pipe section 37, permitting the thickness of the pin 48 of the tubular body to be increased as compared with the form of the invention illustrated in Figure 1. Benefits of the design are that increased structural strength may be provided in the threaded area of the connection and the metal-to-metal seal is effected without a significant increase in the amount of metal in the connection.

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a7 Figure 8 illustrates a modified form of the connector of the present invention indicated generally at 110. The connector 110 includes a pin 111 and a box 112. The pin 111 includes threads 114 that run out on a nominal outside diameter 115 of a pipe section 116. An annular, elastomeric ring 118, having a rectangular cross section, is cemented or otherwise suitably secured to the pin 111 on the outside diameter 115. The ring 118 may be constructed of rubber, Teflon® or other suitable sealing material. An internal, frustoconical seal surface 119 formed adjacent the face 120 of the coupling 112 is adapted to engage and compress the ring 118 to provide the external seal protecting the threads